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A New Method for Measuring Housekeeping Performance Consistency

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A New Method for Measuring Housekeeping Performance Consistency

Abstract

While the importance of housekeepers' task performance (i.e., cleaning) is undeniable, little research has been devoted to developing metrics to evaluate housekeepers' performance. This CHR report describes a pilot study implementing a metric of the overall consistency of housekeeping performance at three hotels, based on cleaning supplies used. Such an approach allows managers to evaluate the consistency of performance within the housekeeping function. Initial results show that the metric has the sensitivity to discover performance inconsistencies, suggesting the need for housekeeper training in certain circumstances. Those interested in using this approach are invited to download a research-data collection kit, and send the data to the author of this report.

Keywords

hotels, housekeeping, housekeeping performance metrics, room cleanliness

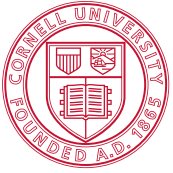**Disciplines**

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A New Method for Measuring
Housekeeping Performance Consistency

by Michael C. Sturman, Ph.D.

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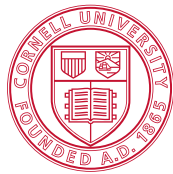
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J ohnsonDiversey, Inc., a global leader of cleaning products and solutions, became a senior partner with the Cornell Hotel School's Center for Hospitality Research in a major commitment to support research that aims to advance operating practices in the hospitality industry.

As a senior partner, JohnsonDiversey sought to underwrite an international research project focusing on the costs and benefits associated with cleaning hotel rooms. This report is the result.

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A New Method for Measuring Housekeeping Performance Consistency

by Michael C. Sturman

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W hile the importance of housekeepers' task performance (i.e., cleaning) is undeniable, little research has been devoted to developing metrics to evaluate housekeepers' performance. This CHR report describes a pilot study implementing a metric of the overall consistency of housekeeping performance at three hotels, based on cleaning supplies used. Such an approach allows managers to evaluate the consistency of performance within the housekeeping function.

Initial results show that the metric has the sensitivity to discover performance inconsistencies, suggesting the need for housekeeper training in certain circumstances. Those interested in using this approach are invited to download a research-data collection kit, and send the data to the author of this report. To participate and receive a personal analysis, register with the Center for Hospitality Research and then download the research kit from the CHR website using the following URL: *http://hotelschool.cornell.edu/chr/research/surveys/hotelcleaning.html*. Each participant will receive a brief report on the consistency of their housekeeping function and a benchmark report describing their performance consistency relative to other hotels providing the same level of service.

A New Method for Measuring Housekeeping Performance Consistency

by Michael C. Sturman

W ould you rather stay in a hotel room where no toilet cleaner—or any cleaning chemical at all—was used during the cleaning process or where the method of cleaning from the housekeeper's training program was followed? If you managed that hotel, which room would you rather make available to your guests? If both rooms still "looked" clean, would you still have a preference?

Those questions are far from rhetorical, because we all know that hotel guests expect a clean room. While hotels that provide training programs for their housekeepers may hope that room cleaning is performed in a manner consistent with hotel standards, monitoring employees' performance is a difficult and time-consuming task. Even with a rigorous inspection system, rooms may look clean, but the processes used to clean the room could still vary widely.

Having made that observation, I cannot state that such potential inconsistency is necessarily bad. We know

that guest rooms must be clean, but beyond that (hard-to-measure) standard, no academic research has considered the performance of housekeepers or the implications of inconsistencies in their performance. This study is spurred by the inadvertent finding that chemical use by housekeepers varies extensively. On its face, that observation seems to indicate a management problem. The purpose of this report is to discuss this finding, demonstrate the use of a metric that can be used to evaluate the consistency of housekeepers' performance, and to solicit participation of hotels **(1)** to help

determine the extent to which this consistency varies, and **(2)** to find out whether such variability predicts important outcomes (notably, guests' reactions to the room). Thus, unlike other *CHR Reports*, you are reading a paper about the beginning of a research journey, not the end. I invite you to participate, and join in the investigation of the metric proposed here.

Hoteliers have no doubt about the importance of housekeeping. Guests in all types of property expect a clean room. Repeatedly, a lack of room cleanliness has been shown to damage guest satisfaction, and when guests raise a room-cleanliness issue, it is almost always to make a complaint.[1] Yet hotels often see housekeeping as a labor expense to be cut.[2] Furthermore, the generally low pay, low prestige, and low barriers to entry and exit make housekeeping notorious for high turnover. That turnover feeds the performance inconsistencies already inherent in housekeeping.
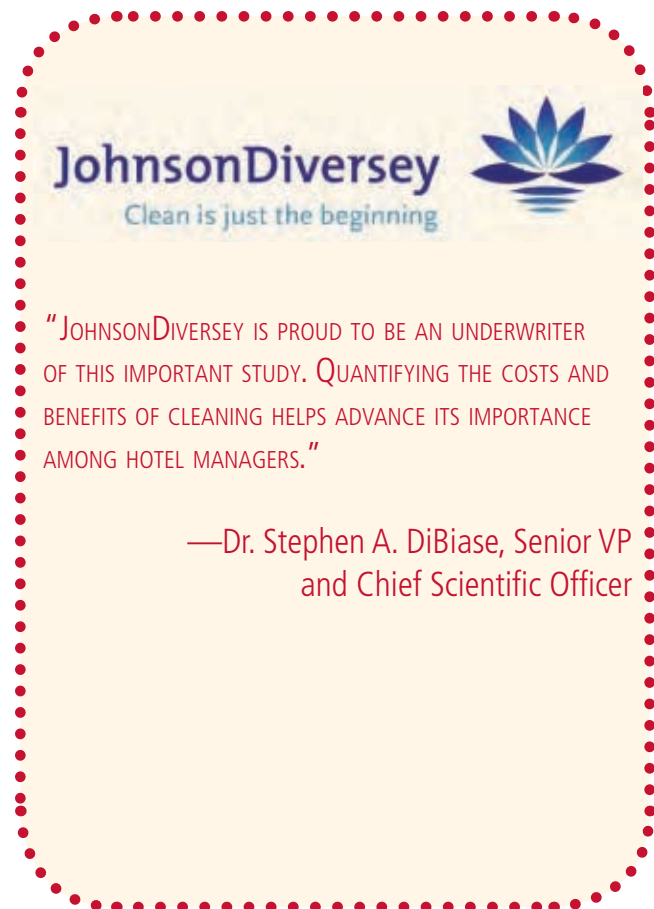
The purpose of this research is to examine the housekeeping function's performance by describing the development and testing of a metric that can be used to evaluate the consistency of a hotel's housekeeping performance. The metric that I propose provides an evaluation of the housekeeping performance at a hotel as a whole. Low scores on the metric suggest an opportunity for focused training efforts to increase the consistency of housekeepers' performance.

This report describes a pilot study that constitutes a first step in developing and testing a methodology for gauging housekeeping consistency. As I describe here, the methodology is implemented at three hotels. Even with this admittedly small sample, I observed a surprisingly wide range of performance scores. The results suggest that we can expect the metric to be sensitive to performance variations among hotel housekeepers.

The goal of this report is thus twofold. First, I describe the research, the metric I employed, the methodology, and the results. Second, and more important, I describe how this study leads into the second phase of research that will involve a broad test of my approach. Participants in this

JohnsonDiversey
Clean is just the beginning

"JohnsonDiversey is proud to be an underwriter of this important study. Quantifying the costs and benefits of cleaning helps advance its importance among hotel managers."

—Dr. Stephen A. DiBiase, Senior VP and Chief Scientific Officer

second phase, in return for providing data, will be provided with a report of their housekeeping consistency and their hotel's performance relative to others participating in the sample. All participants' data will be kept confidential and the only published report will be in aggregate form.

Study Background

This study was made possible by generous funding and support of JohnsonDiversey. Through a grant provided to the Center for Hospitality Research, JohnsonDiversey originally commissioned a study to investigate the cost of cleaning. However, early in the research process, I found that the cost issue was not the foremost matter to be investigated. Instead I found that chemical costs per individual housekeeper are relatively small, and, moreover, the cost per housekeeper varies little. Furthermore, direct and indirect human resources costs (e.g., wages, benefits, training) constitute the bulk of cleaning costs at any hotel. As a result, the cost of cleaning is more a function of policy decisions (e.g., how many housekeepers to hire, how much to pay them, how much to train them), rather than of individual performance.

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[1] For example, see: S. Balmer and T. Baum, "Applying Herzberg's Hygiene Factors to the Changing Accommodation Environment," *International Journal of Contemporary Hospitality Management*, Vol. 5, No. 2 (1993), pp. 32-35; L. Dubé and L.M Renaghan "Strategic Approaches to Lodging Excellence," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 40, No. 6 (December 1999), pp. 16-26; B.J. Knutson, "Frequent Travelers: Making Them Happy and Bringing Them Back," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 29, No. 1 (1988), pp. 82-87; K.W. McCleary, P.A. Weaver, and L. Lan, "Gender-based Differences in Business Travelers' Lodging Preferences," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 35, No. 2 (1994), pp. 51-58; and "Cheers and Jeers from Hotel Travelers," *American Demographics*, Vol. 52, No. 2 (2003), p. 15.

[2] P. Bhatia, "Shabby Chic: Known for Their Good Looks, Hipster Hotels Cut Upkeep; Where Are the Bedspreads?," *Wall Street Journal*, May 7, 2003, p. W1.

Setting aside the cost of cleaning itself, though, my investigation into methods for measuring housekeeping performance revealed a need for reliable, sensitive, and inexpensive performance measures. While the idea of measuring performance at first seemed simple, the nature of the task actually makes it difficult to apply practical performance metrics on a wide scale.

Even though the data I collected suggest that task-performance variance did not have notable direct dollar-value implications, the amount of cleaning products used varied so extensively that I made a deeper investigation into the quality of housekeepers' performance. Wide variation in task execution suggested a critical issue of potential quality variance. Although customer-satisfaction ratings were not a part of this research, extensive variance in chemical use (from extremes of zero toilet cleaner being used by some housekeepers to multiple bottles of cleaner being used by housekeepers on each shift) suggested that I should determine whether the anecdotal evidence of inconsistencies were indeed observed when performance was analyzed using quantitative measures. As a result, the focus of this study moved from evaluating the cost of cleaning to the development, implementation, and evaluation of a metric of housekeepers' performance consistency.

Developing the Performance-consistency Metric:
Measuring Housekeeper Performance through Chemical Use

The literature on job performance suggests many ways to investigate individual performance, and thus provides some insights specifically for evaluating the task performance of housekeepers.[3] However, a number of challenges specific to the housekeeping function affected the way in which I could develop a metric that was useful and sensitive to variances in performance, while still being easy to implement.

Though performance measurement seems simple in concept, it's often difficult to execute. Most examples of performance measurement in the human resources literature employ supervisory evaluations of individuals' performance.[4] For the housekeeping function, though, this is not ideal, primarily because supervisors do not regularly have the opportunity to observe individual housekeepers' performance. Hotels can implement a strong inspection program, but that requires substantial resources (particularly time).

Another approach would be to employ customers' ratings of room cleanliness. This idea seems appealing, given that customers experience first hand the results of the housekeeper's task performance. This approach has a notable weakness because customers often do not complete evaluations unless there is a particular problem. If nothing is overtly wrong, guests tend to provide highly skewed positive evaluations of all questionnaire dimensions, so that managers do not receive a useful description of the performance results. Beyond that, the customer usually cannot directly observe the housekeeper's performance, since the idea is that the room would be made up when the guest is out of the room. The guest can indirectly evaluate certain aspects of the cleaning (e.g., the bed is made, the sink "looks" clean), but actual cleanliness may be impossible to evaluate with the naked eye. A bathroom can appear to be clean even when chemicals have not been used in sufficient quantity to kill viruses and germs. On the other hand, the current state of facilities (such as an aged mirror or shopworn fixtures) may cause guests to perceive a lack of cleanliness when indeed the housekeeper has cleaned the item as specified by management.

A third method would be to obtain quantitative measurements of cleanliness. Equipment and techniques exist to detect contamination by microorganisms and viruses, to measure the change in light reflectance or gloss on surfaces, and to determine the quantity of dust or soils in a given area. The problem with this approach, though, is that it requires expensive equipment, individuals with specialized training to perform the necessary tests, and a lot of time to obtain a representative, statistically reliable measure of cleanliness. Moreover, no standard exists for the "appropriate" level of microorganisms. That is, a level of zero, for instance, may not be necessary or even possible to achieve.

A fourth method would be to use an objective, but indirect measurement of the task at hand. In general, this method requires some quantifiable gauge related to successful performance (e.g., time, units produced, units sold, sales volume, amount of raw materials used). Using objective performance measures has a number of advantages, including greater reliability than subjective measurements and lower costs than more intrusive or detailed measures. This

[3] For example, see: W.H. Bommer, J.L. Johnson, G.A. Rich, P.M. Podsakoff, and S.B. MacKenzie, "On the Interchangeability of Objective and Subjective Measures of Employee Performance: A Meta-Analysis," *Personnel Psychology,* Vol. 48 (1995), pp. 587-605; R.L. Heneman, "The Relationship between Supervisory and Results-Oriented Measures of Performance: A Meta-Analysis," *Personnel Psychology*, Vol. 39 (1986), pp. 811-826; C.E. Lance, M.S. Teachout, and T.M. Donnelly, "Specification of the Criterion Construct Space: An Application of Hierarchical Confirmatory Factor Analysis," *Journal of Applied Psychology,* Vol. 77 (1992), pp. 437-452; R.J. Vance, R.C. MacCallum, M.D. Coovert, and J.W. Hedge, "Construct Validity of Multiple Job-performance Measures Using Confirmatory Factor Analysis," *Journal of Applied Psychology,* Vol. 73 (1988), pp. 74-80; and T.M. Welbourne, D.E. Johnson, and A. Erez, "The Role-Based Performance Scale: Validity Analysis of a Theory-Based Measure," *Academy of Management Journal*, Vol. 41 (1998), pp. 540-555.

[4] M.C. Sturman, "Searching for the Inverted-U-Shaped Relationship Between Time and Performance: Meta-Analysis of the Experience–Performance, Tenure–Performance, and Age–Performance Relationships," *Journal of Management*, Vol. 29 (2003), pp. 609-640.

Measuring cleaning-chemical use can provide an indirect but objective measure of housekeeping consistency.

approach also has disadvantages—notably, that the indirect measure must have actual bearing on the task at hand. Given the differences from other types of performance measures, this approach should be carefully evaluated to determine its appropriateness.[5]

That said, I used the indirect approach for evaluating housekeepers' performance—I believe with some success. In this instance I examined data on cleaning-chemical use as a gauge of housekeepers' consistency in cleaning. Housekeepers use a variety of chemicals in the cleaning process, often including a toilet cleaner, a surface cleaner, and a glass cleaner. The important point here is that the absolute quantity of chemicals that a particular housekeeper uses is not necessarily an indication of high performance. Rather, I approached the problem as one of examining the predictability and the consistency of chemical use.

Based on data of cleaning-chemical use, I focused my attention on consistency, chiefly because comparable rooms should require similar amounts of time and chemicals for cleaning. Indeed, the purpose of many housekeeper-training programs is to prescribe the desired way for a room to be cleaned.[6] Therefore, all else equal, if housekeepers perform their tasks consistently and according to hotel standards, then the same amount of cleaning chemicals will be used in rooms of the same type. Put another way, if two housekeepers were cleaning similar rooms in exact adherence to their training and hotel standards, the amount of cleaning chemicals used should be the same. Consistency of chemical use thus suggests a consistency in task performance.

Of course, all else is rarely equal. Chemical use will vary due to the nature of the cleaning task (various room types; stay-over or check-out room), number of rooms cleaned, the nature of the guests, and even external circumstances (the season and weather). Moreover, if housekeepers thought

they were being evaluated based simply on how much cleaner they used, one could easily see housekeepers making sure to use plenty of cleaning fluids to improve their evaluation. The method I propose, however, goes beyond simple volume of fluids used.

One advantage of measuring chemical use is that all housekeepers are supposed to use similar amounts of the same chemicals in the cleaning process. Thus, this measurement would be consistent across employees. A second advantage is that we can objectively measure chemical use and thus avoid the unreliability and biases associated with subjective measures of performance. Third, hotels generally control and distribute cleaning chemicals at a single, specified location. Thus, one can monitor chemical use relatively easily.

The potential downsides of applying a metric of chemical use seem minimal. First, variations in circumstances that would lead to differences in chemical use would likely be randomly distributed over time and among the housekeepers. Thus, with multiple measurements collected for each person over multiple days, and with data collected on several housekeepers working the same days, such variances will be minimized and the reliability of the metric enhanced. Second, because we are interested in measuring consistency, any attempts by housekeepers to influence the metric (say, by wasting chemicals) will actually decrease performance consistency and be easily observed.

Finally, measuring performance through chemical use is relatively easy (since the hotel already keeps track of its chemical stocks), reliable (with sufficient observations), inexpensive, and generally free from rater bias and housekeepers' influences.

While I do not suggest that measuring chemical use can replace a strong inspection program or make customer ratings useless, the existence of a simple metric of this kind could prove useful for evaluating housekeepers' consistency in cleaning. Thus, I focused my efforts on a chemical-use metric to evaluate a hotel's housekeeping performance consistency.

5 *Ibid.*; and M.C. Sturman, R.A. Cheramie, and L.H. Cashen, "The Consistency, Stability, and Test–Retest Reliability of Employee Job Performance: A Meta-Analytic Review of Longitudinal Findings," *Journal of Applied Psychology*, Vol. 90 (2005), pp. 269-283.

6 R. Selwitz, "Front-line Training Reinforces Standards and Enhances Skills," *Hotel and Motel Management*, Vol. 218, No. 21 (December 8, 2003), pp. 32-33.

Expected Variance in Chemical Use

As noted above, several factors influence the amount of chemical cleaners used by housekeepers. Indeed, there is no doubt that we will observe variances in chemical use. Those who clean more rooms should, on average, use more chemicals, and the nature of the cleaning task will affect chemical use. Housekeepers are expected to perform a more thorough cleaning of check-out rooms than stay-over rooms, for instance. That said, one must understand what sort of variance is expected and be able to separate expected and desirable reasons for performance consistency (or inconsistency) from those indicating performance problems. Put simply, we need to know whether the nature of chemical-use consistency (or inconsistency) is good or bad.

Other sources of expected and understandable performance variance are harder to measure (e.g., guests' use of the room, effects of weather), but these are also more likely to vary randomly over time. For example, the ways in which guests use a room will affect the cleaning needs for the room. Thus, on any given day, chemical-use patterns across housekeepers are likely to vary because of the different guest activities. Over time, however, guests' treatment of any room will even out. That is, sometimes a room or a housekeeper will encounter messy guests, but other times that same room or housekeeper will enjoy neat guests. When a measure is affected by random fluctuations, the reliability of the measure can be improved by increasing the number of observations.[7] As a result, if a measure of chemical use is captured over a long time, then the general tendency of an individual housekeeper's performance should be revealed and the "noise" of guests' behavior should be limited.

So, after controlling for characteristics that cause performance variations, and with a sufficient set of observations to enhance the reliability of the measure, I expected the following observations. If the housekeeper's performance is consistent with a hotel's standards and desired cleaning procedures, control variables explain much of the performance metrics, and then the remaining variance is simply random. On the other hand, inconsistent performance means that individuals are cleaning rooms as they see fit, and not consistent with their hotel's standards.

This situation will show up when one compares the performance of a housekeeper who is operating according to the hotel's standards with one who isn't. The cleaning-chemical use by the consistent housekeeper would be explained well by the circumstances facing that individual, but the chemical use by the inconsistent housekeeper will be better explained by who is doing the cleaning, and not the circumstances associated with the cleaning task. Next, I demonstrate how this situation can be measured, and how the data can be used to reveal the nature of a particular hotel's housekeeping consistency.

Methodology

For the pilot study that tested the cleaning-consistency metric, I collected data at three hotels. The first hotel was a full-service luxury hotel. Housekeepers used three products when cleaning rooms in this hotel: **(1)** a floor and surface cleaner, **(2)** a glass cleaner, and **(3)** and a toilet cleaner. Data were collected on a total of 17 employees on 10 different days. Not all employees worked each of the 10 days; thus, a total of 94 performance observations were collected.

The second hotel was a midscale, limited-service hotel. Four cleaning products were used: **(1)** a bathroom cleaner, **(2)** a furniture cleaner, **(3)** a window cleaner, and **(4)** an air freshener. This hotel employed eight housekeepers. Performance was observed over 36 days, yielding a total of 145 performance observations.

The third hotel was a budget hotel, which used the same cleaners as did the mid-level property. The budget hotel employed three housekeepers, whose performance was measured over 30 days, for a total of 74 performance observations.

Even though the pilot study encompasses only three hotels, it still covered a range of hotel types, a range of housekeepers, and several time spans. This provided a useful test of the proposed methodology before implementing it on a wider scale.

Analyses

The analyses were performed in two steps. Step one involved determining how much variance can be explained due to the circumstances associated with the cleaning situation, and step two considered the sources of variance still remaining after controlling for these factors. Analyses were run separately, thus yielding information specific to each hotel. All of the analyses discussed below were performed on each chemical product at each hotel separately, along with a metric computed as the sum of the standardized values of product use.[8]

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[7] J.C. Nunnally and I.H. Bernstein, *Psychometric Theory*, third edition (New York: McGraw-Hill, 1994).

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[8] For each hotel, and for each chemical used in that hotel, the standardized value of the amount of chemical use was computed. In other words, for each chemical, the mean and standard deviation of chemical use was computed, and the chemical use value for each individual was normalized (by subtracting the mean and dividing the result by the standard deviation). The result of this was a new value for each individual for each chemical use, and the values followed (for each chemical) a normal distribution with a mean of 0.00 and a standard deviation of 1.00. The summed standardized score mentioned above was computed by adding all the standardized scores associated with however many chemical products used, for each individual.

Implementing Analysis Step One

In the first step, the amount of chemical use was the dependent variable in a regression analysis. The independent variables were, for each individual, the number of check-out rooms cleaned on that shift and the number of stay-over rooms cleaned on that shift. One regression was run for each dependent variable at each hotel.

Implementing Analysis Step Two

The second step the residual scores from analysis one as the dependent variable. The individual housekeeper was used as the independent variable, and an ANOVA analysis was performed. Based on this analysis, the inter-class correlation [ICC(1)] for each dependent variable was computed.[9] ICC(1) is a measure of how much variance is explained by who was the housekeeper. High values indicate that knowing who the housekeeper was explained a high proportion of product use variance. ICC(1) scores can be interpreted similarly as R-squared statistics; that is, the score reveals how much variance in chemical use is explained by knowing which housekeeper performed the cleaning task. Again, ANOVAs were run separated for each hotel. The analyses for any given hotel were not dependent in any way on the data or results associated with any other hotel.

Results

Even with the small set of three hotels, notable differences were observed across hotels in our analyses, as shown in Exhibit 1. The nature of the results provide a clear indication of differences in cleaning consistency and suggest that the metric and methodology may be a useful tool for evaluating hotel housekeepers' performance consistency.

Results of Step One of the Analysis

At the full-service luxury hotel, the first step of the analysis explained little variance in cleaning chemical use. Across the four dependent variables (i.e., the three products and the summed standardized measure), R-squared values ranged from 0.00 to 0.02. Furthermore, the effects of room type (whether check-out or stay-over) were not statistically significant.

At the midscale hotel, the first step of the analyses yielded R-squared values ranging from 0.56 to 0.86 (0.82 for

9 See: J.J. Bartko, "On Various Intraclass Correlation Reliability Coefficients," *Psychological Bulletin*, Vol. 83 (1976), pp. 762-765; P.D. Bliese, Within-group Agreement, Non-independence, and Reliability: Implications for Data Aggregation and Analysis," in *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions*, ed. K.J. Klein and S.W.J. Kozlowski (San Francisco, CA: Jossey-Bass, 2000), pp. 349-381; and P.E. Shrout and J.L. Fleiss, "Intraclass Correlations: Uses in Assessing Rater Reliability," *Psychological Bulletin*, Vol. 86 (1979), pp. 420-428.

EXHIBIT 1		
Analysis of housekeeping consistency for three hotels		
	Step 1 R-square	Step 2 ICC(1)
Luxury full-service hotel		
Standardized sum	0.01	0.46
Floor and surface cleaner	0.00	0.85
Glass cleaner	0.02	0.14
Toilet cleaner	0.01	0.47

Note: No significant effects for check-out or stay-over rooms.

Mid-level, limited-service hotel		
Standardized sum	0.82	0.10
Bathroom cleaner	0.75	0.21
Furniture cleaner	0.86	0.05
Window cleaner	0.66	0.12
Air freshener	0.56	0.06

Note: Significant effects for check-out and stay-over rooms.

Budget hotel		
Standardized sum	0.88	0.00
Bathroom cleaner	0.95	0.00
Furniture cleaner	0.62	0.04
Window cleaner	0.58	0.00
Air freshener	0.79	0.00

the summed standardized score). In this case, the effects of stay-over and check-out rooms were statistically significant ($p < .0001$).

Similar results were observed for the budget hotel. For this hotel, the first step of the analysis produced regressions with R-squared values ranging from 0.58 to 0.95 (0.88 for the summed standardized score). Once again, the effects of stay-over and check-out rooms were statistically significant ($p < .0001$).

Results of Step Two of the Analysis

The second set of analyses revealed similarly divergent results. At the luxury hotel, ICC(1) values ranged from 0.14 to 0.85 (0.46 for the summed standardized score). These results indicate that a high percentage of chemical-use variance can be explained by who was doing the housekeeping, keeping in mind that little of the variance in chemical use at this hotel could be explained by what kind of room was being cleaned.

On the other hand, the mid-level and budget hotels present the opposite picture. At the mid-level hotel, ICC(1) values ranged from 0.06 to 0.21 (the ICC[1] for the summed standardized metric equaled 0.10). Combined with the previous set of results, this suggests that at this hotel, cleaning-chemical use is mostly explained by what room was being

cleaned, rather than who the cleaner was. The results at the budget hotel were even more distinctive. ICC(1)s ranged from 0.00 to 0.04 (and the ICC[1] for summed standardized metric equaled 0.00). Here, what type of room was being cleaned explained chemical use (i.e., there were high R-square values from step one), while who did the cleaning was inconsequential (i.e., the ICC[1] values from step two were essentially zero).

Contributions, Implications, Limitations, and Opportunities

While cost variances in cleaning performance are minimal, performance variance in terms of product use is large and potentially important. The cleaning-chemical methodology appears feasible for evaluating housekeepers' performance. I also found opportunities at some locations to gain performance improvements.

Training seems to be the most suitable approach to building consistency of housekeeping performance. First, housekeepers should receive (or refresh) training on how rooms should be cleaned, with a specific focus on the use of the cleaning products involved in the process. Second, housekeepers should be made aware of the importance of consistent performance. This can be done by providing feedback mechanisms for housekeepers, and periodic retraining programs.

Note that it is important not to tie housekeepers' compensation to the amount of cleaning products they use, so that they will not try to game the system, either by dumping or stinting on chemicals to try to get desired rewards. Beyond that, this research focuses on the idea of housekeeping performance consistency at the hotel level, and not the individual level (even though the analyses are based on the collection of individual-level data). Consequently, I suggest using the metrics to make decisions about the hotel's housekeeping function as a whole and not try to make specific performance determinations for particular individuals. Indeed, the types of analyses performed in this study provide no insights on the nature of any given person's performance quality or consistency.

As I stated at the outset, this is a pilot study, which means that more work is needed before any recommendations can be made with a high degree of confidence. The methodology proposed in this paper was easy to implement, and it yielded an evaluation of each hotel's housekeeping consistency within 35 days of when data collection started. This pilot study needs to be expanded to include many more hotels comprising a variety of service levels. Phase II of this project will thus begin where this report ends, expanding on the pilot study to allow more in-depth testing and validation of the housekeeping performance measurement.

The Next Step

In addition to opening a discussion of the initial results, I hope this report has piqued interest in the study and encouraged hotels to participate in the next phase of this research.

Readers of this report are invited to participate as research sites in Phase II of this project. A research kit is available for download on the Center for Hospitality Studies website.[10] The kit provides a succinct description of how to implement the methodology, including how to collect and submit the data for analysis. Participants will receive an assessment of their hotels' housekeeping performance consistency, based on the methods described in this report. I am not asking participants to perform any analysis. Once you collect and submit your data, the analysis will be returned to you. Furthermore, once sufficient data are collected, each hotel will receive a brief report detailing how its score compares to that of other hotels at the same service level.[11] The data collected from the participating hotels will be used to test and validate the performance consistency metric.

First, in addition to the chemical-use data themselves, I will collect data from each participating hotel to help validate the utility of the performance metric developed in

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[10] Individuals can register with the Center for Hospitality Research's website at www.chr.cornell.edu. Registration is free, and allows the user to download content at no charge from the website (including reports like the one that will be created).

[11] Note that in these reports, hotel identity will be protected. Companies will only know their own hotel's results; all other names will be masked and no identifying information will be provided.

this study. While the arguments for the value of housekeeping performance consistency have at least some face validity, it is essential to specify the implications of this consistency. In short, we need to know whether and how this metric predicts outcomes of interest for hotels (e.g., customer satisfaction, turnover, profits). This will require participating hotels to provide data beyond simple housekeeper cleaning-product use. That is why I promise confidentiality in this survey.

Second, I will evaluate the nature and distribution of performance-consistency scores. It will be valuable to know the range of scores observed for a broad set of hotels and to determine whether those scores are contingent on characteristics associated with the hotel. I will test to see whether consistency scores are a function of various hotel characteristics, such hotel type, location, staffing levels, and training budget.

Third, this research effort will allow further consideration of the meaning of the metric itself. While the wide range of scores discussed earlier suggest potential good or bad performance, at this point it is impossible to rule out any particular explanation for a particular score. For example, it is conceivable that something related to upscale service causes lower predictability by room characteristics and higher ICC(1) values. Although this does not seem

likely, it is an explanation that needs to be ruled out. Beyond that we need to set benchmarks and estimate the distribution of consistency levels for all hotels. This will provide more context for interpreting the meaning of subsequent uses of the methodology.

Invitation to Participate

Once again, those interested in participating in this study are welcome. If you have not already done so, you will need to register with Center for Hospitality Research at www.chr.cornell.edu. Registration is free and without obligation. After you register, you can download the research kit from the CHR website, using the following URL: **http://www.hotelschool.cornell.edu/chr/research/surveys/hotelcleaning.html.** The kit gives specific instructions. However, you can also e-mail me at michael.sturman@ cornell.edu, or call me at 607-255-5383 if you have questions. When the data are collected, you will receive a report of your hotel's housekeeping performance consistency. Once a sufficient amount of data has been collected from a variety of hotels (i.e., over 50), you will also receive a report describing your hotel's performance consistency relative to other hotels providing the same level of service. ■

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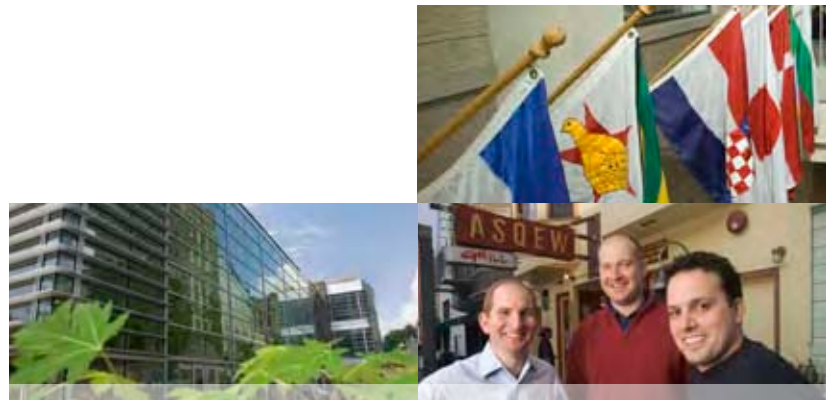A Contemporary Model for Human Resources, by J. Bruce Tracey, Ph.D. and Arthur Nathan

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